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मानक

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Mazdoor Kisan Shakti Sangathan

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“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 487 (2012): Brushes, Paint and Varnish - (i) Oval, Ferrule Bound; and (ii) Round, Ferrule Bound [CHD 24: Brushware]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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भारतीय मानक

रंग रोगन और वार्निश के लिए ब्रश —

(i) अंडाकार फेरुल कसे हुए; तथा

(ii) गोलाकार, फेरुल कसे हुए

(पांचवॉ पुनरीक्षण)

Indian Standard

BRUSHES, PAINTS AND VARNISHES —

(i) OVAL, FERRULE BOUND; AND

(ii) ROUND, FERRULE BOUND

(*Fifth Revision*)

ICS 97.170

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

FOREWORD

This Indian Standard (Fifth Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Brushware Sectional Committee had been approved by the Chemical Division Council.

Oval, ferrule bound brush is meant for excellent painting jobs, such as varnishing or superior finishing of painting work, while round, ferrule bound brush is recommended for rough painting work like preparing of ground or for applying of undercoat of filler on surfaces under painting.

This standard was first published in 1954 and subsequently revised in 1966, 1975, 1985 and 1997 respectively. Based on the technological development in the field during last decade and to meet the need of the users, the Committee decided to revise this standard. In this revision wear and tear requirement has been incorporated, qualitative requirement of pull test is replaced with the quantitative test, approved tender sample have been referred where the Committee felt necessary in absence of proper test method to ensure the absolute criteria.

This standard contains clauses **6.1.1.2** and **6.2.4** which call for agreement between the indenter/purchaser and the supplier.

The composition of the Committee responsible for formulation of this standard is given at Annex G.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value shall be same as that of the specified value in this standard.

Indian Standard

BRUSHES, PAINTS AND VARNISHES —
(i) OVAL, FERRULE BOUND; AND
(ii) ROUND, FERRULE BOUND
(Fifth Revision)

1 SCOPE

This standard prescribes the requirements and the methods of sampling and test for brushes, paint and varnish (a) oval, ferrule bound; and (b) round, ferrule bound, made from bristles and set in a suitable cement.

2 REFERENCES

The following standards contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below.

<i>IS No.</i>	<i>Title</i>
321 : 1964	Specification for absolute alcohol (<i>revised</i>)
380 : 1978	French chalk, technical (<i>second revision</i>)
534 : 1992	Benzene — Specification (<i>third revision</i>)
539 : 1974	Specification for naphthalene (<i>second revision</i>)
707 : 1976	Glossary of terms applicable to timber and timber technology and utilization (<i>second revision</i>)
1844 : 1993	Bristles (<i>second revision</i>)
5060 : 1969	Glossary of terms used in brushware industry

3 TERMINOLOGY

For the purpose of this standard, the definitions given in IS 707, IS 5060 and the following shall apply.

3.1 Approved Tender Sample

The sample accepted by the indenter or inspection authority as basis for supply.

NOTE — When a sample is tested and approved by the purchaser or an inspection authority, the results of such tests as will permit the supplier to meet the limits imposed by the specification for deliveries, shall be made available to the supplier.

4 TYPES

Brushes shall be of two types, namely:

- a) Oval, ferrule bound; and
- b) Round, ferrule bound.

5 SIZES

Oval, ferrule bound brushes shall be of five sizes with denominations 1/0, 2/0, 3/0, 4/0 and 6/0 and round, ferrule bound brushes shall be of 2/0, 3/0 and 4/0.

6 REQUIREMENTS**6.1 Materials**

The brush shall be manufactured from the following materials.

6.1.1 Filling Materials

6.1.1.1 Selected, properly straightened bristles of natural colour (conforming to IS 1844) and of description given below shall be used:

- a) For brush, oval ferrule bound — soft or semi-stiff/stiff black bristle; and
- b) For brush, round ferrule bound — semi-stiff/stiff grey bristles.

6.1.1.2 As regards colour, luster and stiffness, the bristles shall match those used in the approved sample.

6.1.2 Timber

6.1.2.1 Any of the timber species listed in Annex A shall be used in the manufacture of handles.

6.1.2.2 The timber shall be reasonably straight grained and well seasoned to a moisture content not exceeding 15 percent, when tested by either electronic moisture meter or by oven drying method as specified in Annex B. However, in case of dispute oven drying method shall be referred.

6.1.2.3 The timber shall be free from brashness, any kind of biological or non-biological deterioration, insect attack, centre-heart (pith), knots (except live pin knots), cracks, warp and any other defects which may reduce the life of the brush or affect its utility.

6.1.3 Ferrule

The ferrule shall be of mild steel sheet of thickness 0.8 ± 0.2 mm and shall also be electroplated.

6.1.4 Plug

A wooden wedge of suitable size, shape and design shall be used to get required tightness of bristle bunch for cementing, as well as to impart greater flexibility to the brush.

6.1.5 Nails**6.1.5.1 For oval, ferrule bound brush**

For securing the bridle strip and the ferrule to the handle, four round headed steel nails of 1.40 mm diameter and 12.5 mm length shall be used.

6.1.5.2 For round, ferrule bound brush

For securing the ferrule to the handle, four round headed steel nails of 1.40 mm diameter and 12.5 mm length shall be used.

6.1.6 Cement

6.1.6.1 Any suitable cement for setting, capable of

satisfying the tests specified under **6.4**, **6.5** and **6.6** shall be used. Vulcanized rubber setting may be used subject to agreement between the indenter and the supplier. In no case shall the cement for setting appear out of the ferrule.

6.1.6.2 For fixing the rubber setting and bristles for a longer period, 2 to 4 steel nails may be used. For size Nos. 1/0, 2/0 and 3/0 nails of size 0.9-1.2 mm diameter \times 20 mm long and for 4/0 and 6/0 nails of sizes 0.9-1.2 mm diameter \times 25 mm long shall be used.

6.2 Dimensions and Tolerances

6.2.1 Oval, ferrule bound brushes shall conform to the dimensions given in Table 1.

6.2.2 Round, ferrule bound brushes shall conform to the dimensions given in Table 2.

6.2.3 The tolerance on the linear dimensions shall be as specified in Table 3.

6.2.4 The solid dressing of the bristles used shall be according to the approved tender sample, if so agreed by the indenter; otherwise it shall comply with the provisions given in Table 1 of IS 1844.

Table 1 Requirements of Brushes, Paint and Varnish, Oval Ferrule Bound
(Clause 6.2.1)

Sl No.	Size No. (Denomination)	Bristle		Length of Handle		Dia of Ferrule		Bridle Strip		Mass of Bristles per Finished Brush
		Protrusion	Overall Length	Outside the Ferrule	Inside the Ferrule	Major Axis	Minor Axis	Height	Diameter	
		<i>A</i> Min mm	<i>B</i> Min mm	<i>C</i> mm	<i>D</i> mm	<i>E</i> mm	<i>F</i> mm	<i>G</i> mm	<i>H</i> mm	g
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
i)	1/0	70	83	153	13	40	35	40	40	40
ii)	2/0	76	89	153	13	45	40	45	45	50
iii)	3/0	82	95	153	13	50	45	50	50	70
iv)	4/0	89	102	153	13	55	50	55	55	90
v)	6/0	95	108	153	13	60	55	60	60	110

Table 2 Requirements of Brush, Paint and Varnish, Round Ferrule Bound
(Clause 6.2.2)

Sl No.	Size No. (Denomination)	Bristle		Length of Handle		Dia of Ferrule		Mass of Bristles per Finished Brush
		Protrusion	Overall Length	Outside the Ferrule	Inside the Ferrule	Upper Side ¹⁾	Lower Side ¹⁾	
		<i>A</i> Min mm	<i>B</i> Min mm	<i>C</i> mm	<i>D</i> mm	<i>E</i> mm	<i>F</i> mm	g
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
i)	2/0	95	108	177	13	40	45	70
ii)	3/0	101	114	177	13	50	45	105
iii)	4/0	108	121	177	13	55	50	120

¹⁾ These dimensions are internal.

Table 3 Tolerances on the Linear Dimensions
(Clause 6.2.3)

SI No.	Nominal Dimension mm	Tolerance mm
(1)	(2)	(3)
i)	Up to 15	± 1.0
ii)	Over 15 but below 40	± 2.0
iii)	40 and above	± 3.0

NOTE — This tolerance shall not apply to bristles for which minimum lengths have been prescribed in Tables 1 and 2.

6.3 Manufacture

6.3.1 Oval, ferrule bound brush shall generally conform to the shape and design shown in Fig. 1.

6.3.1.1 Details of ferrule and bridle strip of oval, ferrule bound brush shall be as shown in Fig. 2 and Fig. 3 respectively.

6.3.1.2 In oval, ferrule bound brushes, the bridle strip and the side strip shall be placed in position, and the ferrule and the side strip shall be secured to the handle by means of four nails.

6.3.2 Round, ferrule bound brush shall correspond to the shape and design shown in Fig. 4.

6.3.2.1 In round, ferrule bound brush, the ferrule shall be secured to the handle by means of four nails.

6.3.3 The bristles with wedge shall be properly set and firmly cemented into the ferrule. There shall be no loose bristles and the cement shall not flow out of the ferrule.

6.3.3.1 *Bevelling of working edge*

The working edge of the brush shall be beveled as shown in Fig. 1 for oval, ferrule bound brushes and Fig. 4 for round, ferrule bound brushes.

6.4 Pull Test

The force required for pulling out an individual tuft shall not be less than 5 kg for 1 min when tested according to the method given in Annex C.

6.5 Benzene — Alcohol Test

Immerse the bristle portion of the brush for 48 h in a mixture of benzene (see IS 534) and denatured spirit (see IS 321) (1 : 1 by volume) at room temperature, in such a way that the upper edge of the ferrule (on the handle side) is approximately 6 mm above the level of solvent mixture and the bristles do not touch the bottom of the container. Maintain the level of solvent during the test. On completion of this test, the bristles shall show no sign of loosening when used as a brush without paint on a plane surface.

6.6 Oven Test

6.6.1 *For Non-rubber Set Brushes*

The brush, without handle, when suspended in an oven with the protruding bristle end upwards and subjected to a temperature of $60 \pm 2^\circ\text{C}$ for 4 h, shall show no appreciable creeping of the cement. Further, after cooling in air for 30 min, the bulk of bristles shall not become loose inside the ferrule and the cement shall satisfy the pull test prescribed under **6.4**.

6.6.2 *For Rubber Set Brushes*

The brush, without handle, when suspended in an oven with the protruding bristle end upwards and subjected to a temperature of $132 \pm 2^\circ\text{C}$ for 2 h, shall show no appreciable creeping of the cement. Further, after cooling in air for 30 min, the bristles shall not become loose inside the ferrule and the cement shall satisfy the pull test prescribed in **6.4**.

6.7 Detection of Dyed Bristles

The following two methods shall be utilized for detection of dyed bristles when tested as prescribed in Annex C of IS 1844:

- a) *Method A* — By microscopic examination; and
- b) *Method B* — By sand paper test.

6.7.1 Method A shall be the referee method in case of any dispute and Method B shall be used for routine testing.

6.8 Curving of Bristles

The processing of bristles when tested by method given in Annex D shall be considered satisfactory if not less than 85 percent of the bristles by mass are as prescribed in **D-3.2** (a) and **D-3.2** (b) and out of these 60 percent shall belong to category **D-3.2** (a).

6.9 Wear and Tear of the Bristles

The test is required to determine the wear and tear of the bristles during practical use of the brush in the shops. The length of the bristles both before and after the practical use of the brush shall be measured. The brush shall be kept horizontally on a table. A steel strip about 50 mm wide shall be held vertically over one of its large edges at the bristles end of the brush in such a way that the bristles are just touching the strip. The distance between the lower end of the ferrule and the edge of the strip shall be measured to give the length of the bristles. The length of the bristles shall also be measured at the end of the practical use in the manner described above. Wear and tear of the bristle is the difference of length in the bristle of the above two readings, that is before and after use for 60 h shall not exceed 5 mm.

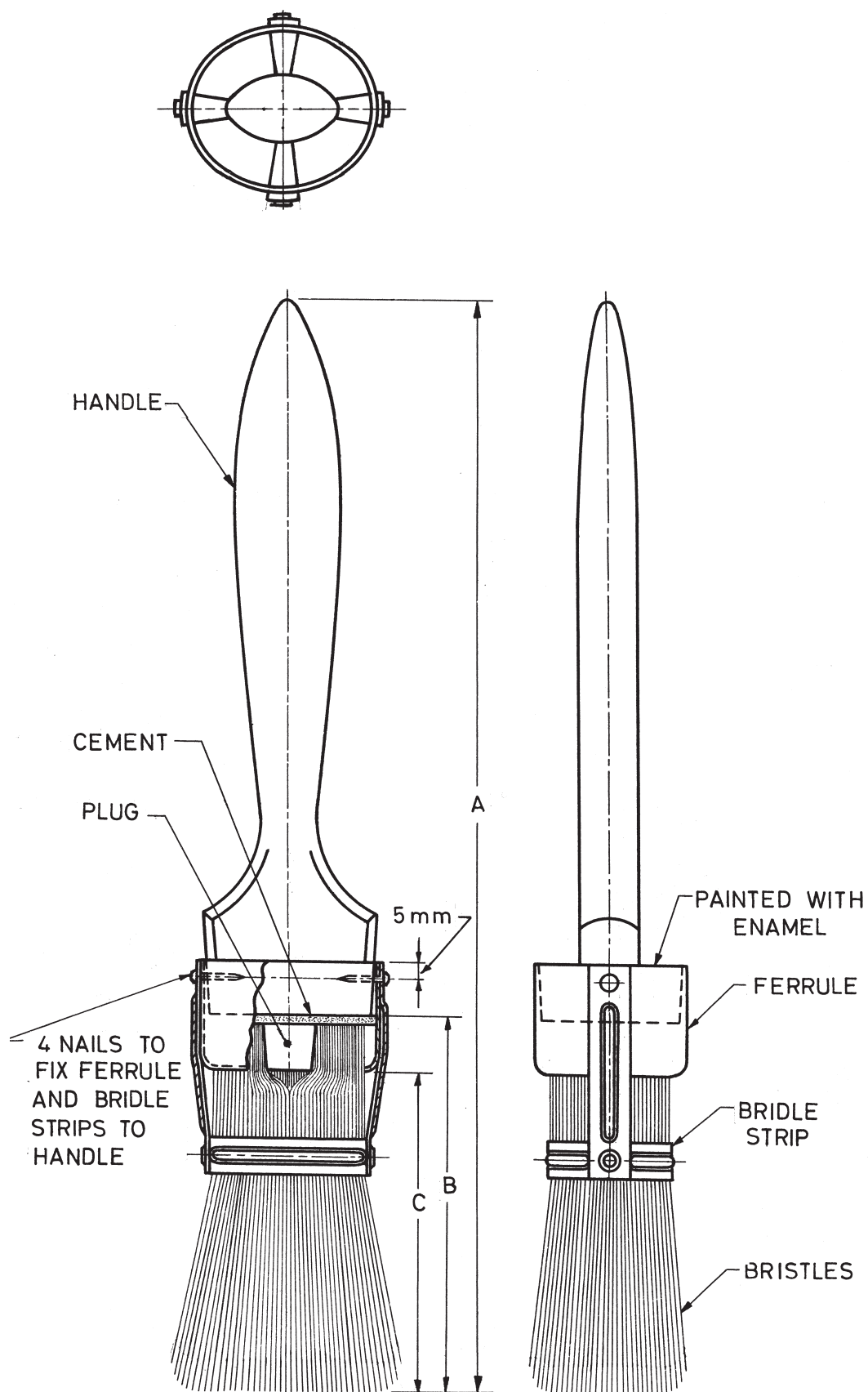
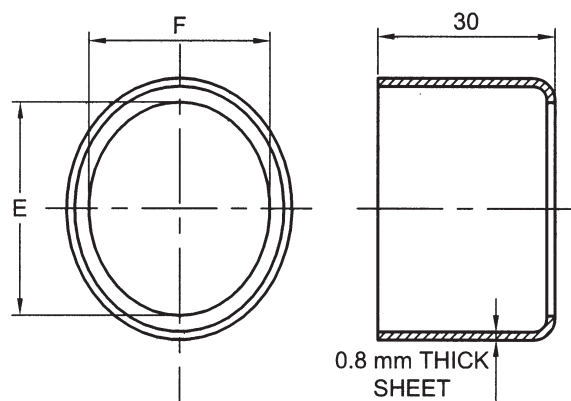
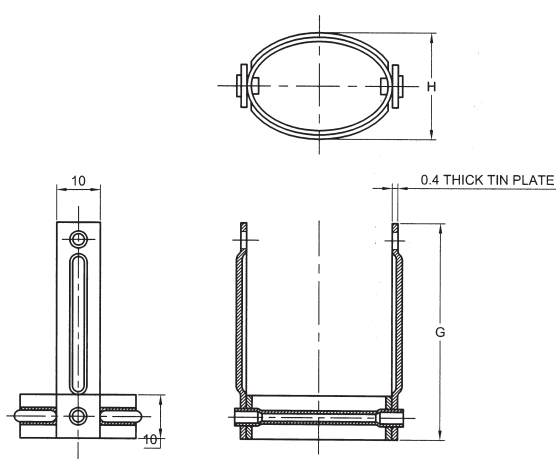


FIG. 1 SHAPE AND DESIGN OF BRUSHES, PAINT AND VARNISH, OVAL, FERRULE BOUND



All dimensions in millimetres.

FIG. 2 DETAILS OF FERRULE OF BRUSHES, PAINT AND VARNISH, OVAL, FERRULE BOUND



All dimensions in millimetres.

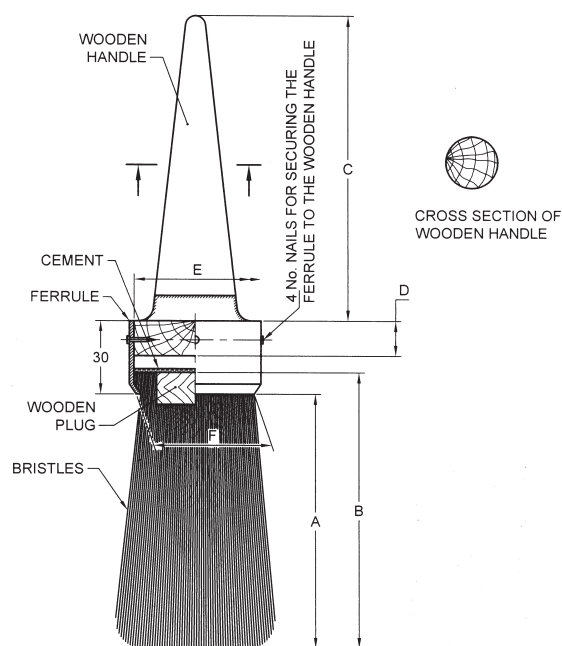
FIG. 3 DETAILS OF BRIDLE STRIP OF BRUSHES, PAINT AND VARNISH, OVAL, FERRULE BOUND

6.10 Mass of Bristles per Finished Brush

The mass of bristles, as determined by the method prescribed in Annex E, shall be as specified in Tables 1 and 2. A tolerance of ± 5 percent shall be allowed on the mass of filling material provided the average mass of the filling material per brush, in any lot, is not below that specified. The average mass of filling material per brush, in a lot, shall be assessed by taking the average mass of filling material of three brushes in lots not exceeding 300 brushes and six brushes in lots exceeding 300 brushes.

6.11 Workmanship and Finish

6.11.1 The handle shall be finished smooth all over and shall be properly varnished or lacquered.



All dimensions in millimetres.

FIG. 4 SHAPE AND DESIGN OF BRUSHES, PAINT AND VARNISH, ROUND, FERRULE BOUND

6.11.2 The ferrule shall be free from sharp edges.

6.11.3 In general workmanship and finish, the brushes shall match the approved tender sample.

7 PACKING AND MARKING

7.1 Packing

The brushes shall be packed as agreed to between the purchaser and the supplier.

7.2 Marking

Each brush shall be legibly and indelibly marked with the following information:

- Indication of source of manufacture;
- Size and type of brush; and
- Month and year of manufacture.

7.2.1 BIS Certification Marking

The product may also be marked with the Standard Mark.

7.2.1.1 The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

8 PRESERVATION

The filling material of the brushes shall be liberally dusted before packing with a mixture of 5 percent by mass of BHC dusting powders and 95 percent by mass of French chalk, technical (see IS 380). Alternatively, naphthalene ball (see IS 539) be used in the packing box for the brushes.

9 SAMPLING AND CRITERIA FOR CONFORMITY

9.1 Samples

The supplier shall submit four identical brushes of each size for approval.

9.1.1 The indentor or inspection authority shall retain one of the four approved tender samples against each item till the completion of the order.

9.2 Sampling

The method of drawing representative samples of the brushes and the criteria for conformity shall be as prescribed in Annex F.

ANNEX A (Clause 6.1.2.1)

SPECIES OF TIMBER FOR MANUFACTURE OF HANDLES

A-1 The list of species of timber approved for the manufacture of handles for brushes, is given below:

Trade Name		Botanical Origin
Roman	Devanagari	
Aini	ऐनी	<i>Artocarpus hirsutus</i> Lamk., fam. <i>Moraceae</i>
Banati	बनाती	<i>Lophopetalum wightianum</i> Arn., fam. <i>Celastraceae</i>
Bijasal	बीजसाल	<i>Pterocarpus marsupium</i> Roxb., fam. <i>Fabaceae</i>
Champak	चम्पक	<i>Michelia champaca</i> Linn., fam. <i>Magnoliaceae</i>
Chickrassi	चिकरासी	<i>Chukrasia tabularis</i> A. Juss., fam. <i>Meliaceae</i>
Dhaman	धामन	<i>Grewia tilifolia</i> Vahl, fam. <i>Tiliaceae</i>
Gamari (gumhar)	गमारी (गुम्हार)	<i>Gmelina arborea</i> Roxb., L., fam. <i>Verbenaceae</i>
Haldu	हल्दू	<i>Adina cordifolia</i> Hook f., fam. <i>Rubiaceae</i>
Kaim	कैम	<i>Mitragyna parvifolia</i> (Roxb.) Korth. Syn. <i>Stepthagyne parvifolia</i> Korth., fam. <i>Rubiaceae</i>
Kanju	कांजू	<i>Holoptelea integrifolia</i> Planch., fam. <i>Ulmaceae</i>
Kathal	कटहल	<i>Artocarpus heterophyllus</i> Lam. Syn <i>A. Integrifolia</i> Auct., fam. <i>Moraceae</i>
Kuthan	कूथन	<i>Hymenodictyon excelsum</i> Wall., fam. <i>Rubiaceae</i>
Lambapatti	लाम्बापत्ती	<i>Planchonella longipetiolatum</i> H. J. Lam., syn. <i>Sideroxylon longipetiolata</i> King et Prain, fam. <i>Sapotaceae</i>
Aam (Mango)	आम	<i>Mangifera indica</i> Linn. fam. <i>Anacardiaceae</i>
nim-chameli	नीम — चमेली	<i>Millingtonia hortensis</i> Linn. F. fam. <i>Bignoniaceae</i>
Kodapalai (piney)	कोडपलाई (पिने)	<i>Kingiodendron pinnatum</i> Harms, Syn. <i>Hardwickia pinnata</i> Roxb., fam. <i>Leguminosae</i>
Toon	तून	<i>Toona ciliata</i> Roem., syn. <i>Cedrela toona</i> Roxb., fam. <i>Meliaceae</i>

ANNEX B

(Clause 6.1.2.2)

DETERMINATION OF MOISTURE CONTENT FOR TIMBER USED IN HANDLES FOR BRUSHES

B-1 TEST SPECIMEN

The entire block used in manufacture of handles may form the test specimen for determination of moisture content or a coupon cut from the test specimen may, as well, be used for moisture content determination. When for any reason additional determination of moisture content is required, separate samples shall be prepared from the sample material as is used in preparing the test specimens. Smaller specimens may be used, when deemed necessary. The test shall be carried out immediately after cutting the specimen.

B-2 PROCEDURE

Weigh accurately each test specimen. This specimen shall then be dried in a ventilated oven at a temperature

of $105 \pm 2^\circ\text{C}$. The weight shall be recorded at regular intervals. The drying shall be considered to be complete when the variation between the last two weighings, does not exceed 0.002 g. The final weight shall be taken as oven dry weight.

B-3 CALCULATION

The moisture content, expressed as percent of the dry mass, is given by the following formula:

$$\text{Moisture content, percent of the dry mass} = \frac{M_1 - M_0}{M_0} \times 100$$

where

M_1 = initial mass of the test specimen, in g; and

M_0 = dry mass of the test specimen, in g.

ANNEX C

(Clause 6.4)

DETERMINATION OF PULL STRENGTH

C-1 APPARATUS

A simple instrument as shown in Fig. 5 can be used for testing the pull strength. This unit is suitable for mounting on wall. It consists of dial force gauge/ weighing scale (0-10 kg) operating on spring (A) mounted on wooden plate (B). A tubular tuft holder (C) is hung on the hook of dial gauge. A clamp for holding the brush (E) is provided which is movable downward and upward with a screw (F). The dial force gauge/ weighing scale shall be calibrated having traceability to NPL.

NOTE — Manufacturer may use sophisticated electronic instrument available in market to determine the pull strength.

C-2 PROCEDURE

C-2.1 Fix a brush with bristles in upward direction in

the brush holder with the help of screw (G). Divide the bristles into 5 segments for oval/round brushes.

C-2.2 Insert all bristles of one segment in the hole provided at the bottom of tubular tuft holder (C). Care should be taken not to allow bristles from adjacent segment to enter in to the hole. Fix the bristles firmly with the help of screw (D).

C-2.3 Adjust the pointer on dial to zero by adjustment of screw (F).

C-2.4 Move down the brush holder slowly with screw (F) watching the pointer on dial carefully till it reaches 5 kg mark and keep it there for 1 min. Then remove the brush from the gadget and examine. The bristles of any segment shall not come out of the cement during the test.

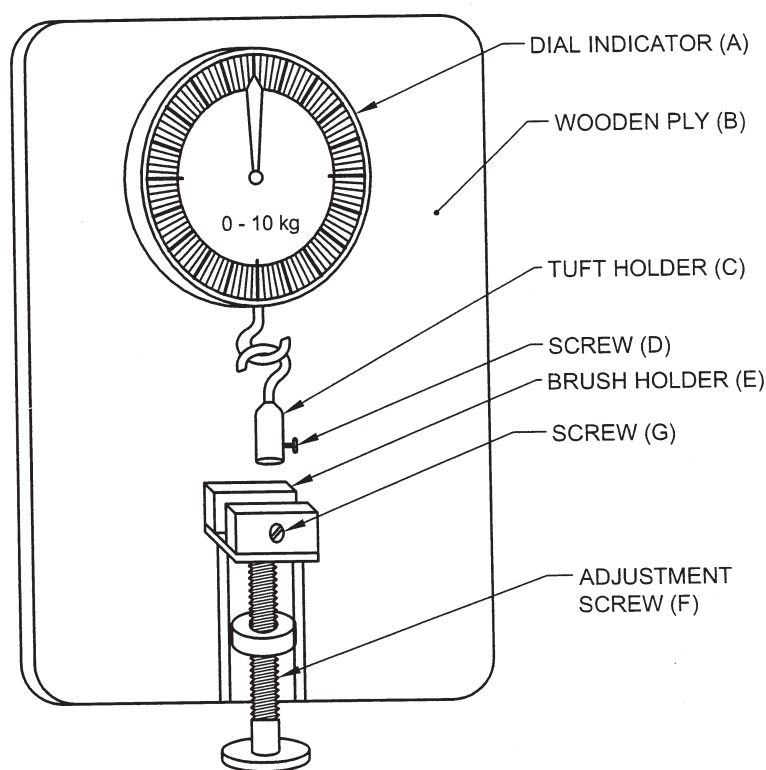


FIG. 5 INSTRUMENT FOR DETERMINATION OF PULL STRENGTH

ANNEX D

(Clause 6.8)

METHOD OF TEST FOR PROCESSING OF BRISTLES

D-1 GENERAL

The objective of this test is to determine whether the processing of the bristles, for elimination of their natural tendency to curve, has been adequate or not.

D-2 TEST SAMPLE

A bunch of bristles, free from cement as prescribed in this Annex and consisting of at least 50 percent of the total mass of the filling material of the brush, shall constitute the test sample.

D-3 PROCEDURE

D-3.1 Tie the test sample of the filling material with

thread or linen tape at one end and suspend it in water maintained at $70 \pm 2^\circ\text{C}$ for 10 min. Remove the bristles from the water and shake to remove as much water as possible. Untie the knot and spread out all the bristles on a large sheet of blotting paper in a warm place. Allow to dry at room temperature for 48 h.

D-3.2 The bristles shall then be examined and categorized as below:

- a) Bristles which are straight;
- b) Bristles which have a curvature of radius 230 mm or more (see Fig. 6); and
- c) Remainder.

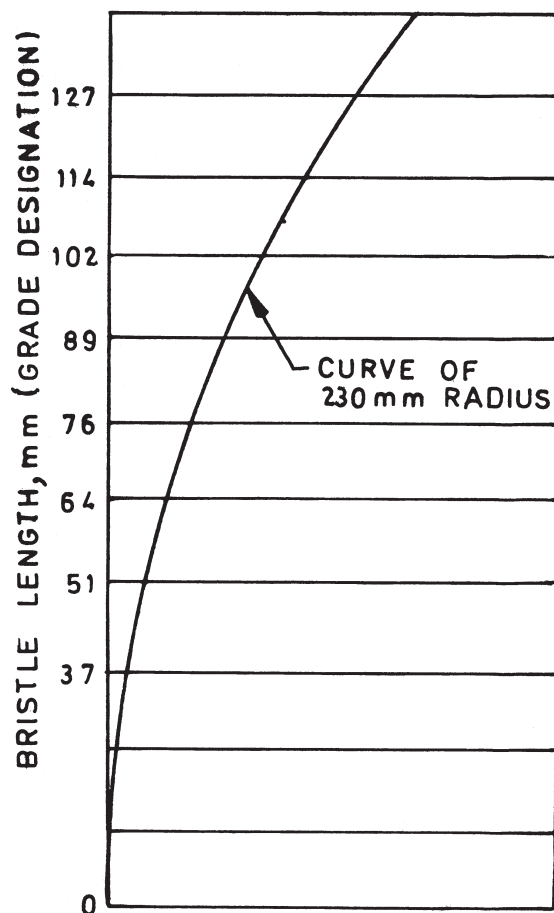


FIG. 6 CURVING OF BRISTLES

ANNEX E

(Clause 6.10)

METHOD FOR DETERMINATION OF MASS OF BRISTLES

E-1 GENERAL

For determining the mass of bristles in a brush, they are detached by gentle hammering as described under **E-2.1**, or, if the bristles are set in vulcanized rubber, by soaking in a solvent and detaching the bristles from the cement as described under **E-2.2**.

E-2 PROCEDURE

E-2.1 For Cement Other than Vulcanized Rubber

Remove all connecting pins as well as those securing the handle. Cut the ferrule right through its length on any one of the sides by means of a chisel. Open the ferrule and remove the bristles. Hammer the root ends of the bristles gently with a raw hide mallet to reduce the cement to powder and shake the bristles. Repeat this process till all traces of cement are removed. Dry the bristles in an oven at $100 \pm 2^\circ\text{C}$ for 30 min. Cool

for 24 h in air and weigh under prevalent atmospheric conditions.

E-2.2 For Vulcanized Rubber Setting

Open the ferrule as described under **E-2.1** and remove the bristles. Soak the setting in an appropriate solvent until it is sufficiently friable to be broken down. This should normally take 12 h to 18 h. Remove the bristles from the solvent mixture and gently knead between the fingers so as to separate the bristles from the block into which they are mounted, but taking care that no undue force is used which may break the bristles. Repeat this process until the bristles are free from vulcanized rubber setting. Dry the bristles in an oven at $100 \pm 2^\circ\text{C}$ for prevalent atmospheric conditions.

NOTE — Trichloroethylene is suitable for rubber and pitch settings, and acetone for synthetic resin settings.

ANNEX F

(Clause 9.2)

SAMPLING AND CRITERIA FOR CONFORMITY

F-1 SCALE OF SAMPLING

F-1.1 Lot

In any consignment, all the brushes of the same type and size shall be divided into groups of 1 000 brushes and each such group shall constitute a lot. Care shall be taken to ensure that brushes included in a lot do not differ in construction, as far as possible.

F-1.2 The conformity of the brushes in a lot to the requirements of this standard shall be ascertained for each lot separately.

F-1.3 The number of brushes to be selected for this purpose shall be in accordance with Table 4.

F-1.3.1 The brushes shall be selected at random. To ensure randomness of selection, a random number table as agreed to between the purchaser and the supplier shall be used. In case such a table is not available, the following procedure shall be used:

- a) If all the brushes in a lot are packed in one box, then starting from any brush, count them in any suitable order as 1, 2 ..., up to r and so on, where r is the integral part of N/n (N and n being the lot size and sample size respectively). Every r th brush thus counted shall be withdrawn to constitute the sample, or
- b) If the brushes in a lot are packed in more than one box, approximately equal number of brushes shall be picked up at random from as many boxes as possible so as to obtain the required number of brushes as specified in Table 4.

F-2 NUMBER OF TESTS AND CRITERIA FOR CONFORMITY

F-2.1 All the brushes selected according to **F-1.3** shall be examined for constructional requirements given under **6.2** and **6.3**. A brush failing in one or more of these requirements shall be considered as defective.

F-2.2 The lot having been found satisfactory according to **F-2.1** shall further be subjected to tests given

under **6.4** to **6.10**. For this purpose, three brushes shall be selected from a lot containing 500 or less brushes and six from a lot containing more than 500 brushes, whatever may be the lot quantity or offered quantity for inspection. These brushes may, however, be taken from those already examined and found satisfactory according to **F-2.1**.

Table 4 Scale of Sampling
[Clauses F-1.3 and F-1.3.1(b)]

Sl No.	No. of Brushes in the Lot	No. of Brushes to be Selected
(1)	N (2)	n (3)
i)	Up to 10	2
ii)	11-25	3
iii)	26-50	4
iv)	51-100	5
v)	101-150	6
vi)	151-300	7
vii)	301-500	8
viii)	501-750	9
ix)	751-1 000	10

F-2.2.1 Pull test, benzene alcohol test and oven test shall be performed first, on each of the brushes selected according to **F-2.2** and then these brushes shall be subjected to mass of bristles per finished brush, curving of bristles and detection of dyed bristles in this order, according to methods given in **6.7**, **6.8** and **6.10** respectively.

F-2.2.2 The lot shall be deemed to have met the requirements for these tests, if no failure occurs under **F-2.2**; otherwise not.

F-3 CRITERIA FOR CONFORMITY

The lot shall be declared as conforming to the requirements of this standard, if **F-2.1** and **F-2.2** are satisfied.

NOTE — For description of bristles (*see* **6.1.1**) and workmanship and finish (*see* **6.11**), the brushes selected according to **F-1.3.1** shall be matched with the approved tender sample which is suitably stamped and sealed by the purchaser or the inspection authority and kept at a place agreed to between the two.

ANNEX G

(Foreword)

COMMITTEE COMPOSITION

Brushware Sectional Committee, CHD 24

<i>Organization</i>	<i>Representative(s)</i>
Office of the Development Commissioner, New Delhi	DR P. K. CHAUDHURI (Chairman) SHRI R. K. PYNE (<i>Alternate</i>)
A. K. Ghosal & Sons, Kolkata	SHRI R. K. GHOSAL SHRI V. GHOSAL (<i>Alternate</i>)
AB Composites (P) Ltd, Kolkata	SHRI ANUKUL SAMANTA SHRI BASUDEV SAMANTA (<i>Alternate</i>)
BHEL, New Delhi	REPRESENTATIVE
Brushwell & Co, Kolkata	SHRI JAYCHANDRA MEHTA SHRI KETAN SHAH (<i>Alternate</i>)
Central Brush Works, Kolkata	SHRI A. K. SIKDAR SHRI A. SIKDAR (<i>Alternate</i>)
Colgate-Palmolive (India) Ltd, Mumbai	SHRI A. G. GAITONDE SHRI RISHI SRIVASTAVA (<i>Alternate</i>)
Directorate General of Supplies & Disposals (QA), New Delhi	SHRI P. K. MAHANA SHRI R. GHOSH (<i>Alternate</i>)
Directorate of Marketing & Inspection, Faridabad	DR G. GOPALA RAO
Eastern Railway Carriage & Wagon Workshop, HOWRAH	SHRI B. R. GANGULY SHRI B. D. DAS (<i>Alternate</i>)
Federation of Consumer Associations of West Bengal, Kolkata	SHRI BIPLAB SARKAR SHRI KAMAL SENGUPTA (<i>Alternate</i>)
Forest Research Institute, Dehradun	SHRI RAJESH BHANDARI
Hindustan Lever Ltd, Mumbai	SHRI N. S. BIJLANI SHRI VIJENDRA BOONLIA (<i>Alternate</i>)
Indian Airlines, New Delhi	REPRESENTATIVE
Indian Soaps & Toiletries Manufacturers' Association, Mumbai	SHRI MADAN THAKUR
Ministry of Defence (DGQA) Comptrollerate of Quality Assurance (GS), Kanpur	SHRI NUSRAT ULLAH SHRI A. K. GANGULY (<i>Alternate</i>)
Ministry of Defence (R & D), Kanpur	SHRI RAVINDRA KUMAR SHRI V. K. SINGH (<i>Alternate</i>)
Ministry of Railways, Research, Design & Standards Organization, Lucknow	SHRI P. MURALIDHARAN
National Test House, Kolkata	DR I. N. MUKHERJEE DR P. KANJILAL (<i>Alternate</i>)
Ordinance Factory, Moradnagar	REPRESENTATIVE
Ordinance Factory Board, Kolkata	SHRI RAKESH SURYA SHRI VIJAY SINGH (<i>Alternate</i>)
RITES Limited, New Delhi	SHRI J. S. AZAD SHRI V. K. JAIN (<i>Alternate</i>)
Usha Industries, New Delhi	SHRI DHARAMBIR
Wild Life Crime Control Bureau, New Delhi	SHRI A. K. SOLO
BIS Directorate General	SHRI E. DEVENDAR, Scientist 'F' & Head (Chem) [Representing Director General (<i>Ex-officio</i>)]

Member Secretary
SHRI N. K. PAL
Scientist 'E' (Chem), BIS

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